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The Influence of Patient Exposure to Breast Reconstruction Approaches and Education on Patient Choices in Breast Cancer Treatment

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Background: The landscape of surgical and medical management and patient choices for breast cancer treatment changes as breast reconstruction and oncoplastic approaches improve and diversify. Increased access to breast reconstruction, in addition to patient education, influences the breast cancer patient. Therefore, the examination of the possible impact of reconstructive surgery on all stages of the breast cancer management per se seemed timely.

Methods: Plastic surgery consults were arranged for 520 new patients diagnosed with breast cancer (2012–2016) including patients with noninvasive breast cancer but at high risk of further cancer development. To test the plastic surgery impact on patient choices regarding the management of the cancer, a subset of 90 patients was identified to test the plastic surgery impact on patient choices. These patients were referred to plastic surgery, following the first round of consultations by surgical and medical oncologists with only the preliminary oncological management plan defined. After a plastic surgery consultation, but prior to finalization of the overall oncological management plan, they were surveyed on the subject of modification of their personal choices and requests pertaining to their cancer management.

Results: In this subset of 90 patients 40 (44%) returned to their surgical or medical oncologist considering changes of the primary management plan after their plastic surgery consultation. Twenty-six (28%) ultimately altered their plan, and the following patient-driven changes were made: mastectomy as opposed to lumpectomy (18 patients [20%]), contralateral prophylactic mastectomy (11 patients [12%]), nipple/areola removal as opposed to nipple/areola sparing suggested by the oncologists (5 patients [6%]), oncoplastic breast reduction as part of lumpectomy (5 patients [6%]), and other modifications (3 patients [3%]).

Conclusions: Decisions for altering the preliminary oncologic plan or choosing a specific alternative (eg, lumpectomy plus radiation vs mastectomy) resulted from patient education on (1) reconstructive options, (2) aesthetic pitfalls and results. and (3) their interfacing with the oncological outcomes. Ultimately, plastic surgeons influence the multispecialty breast cancer management and patient decision-making process. Therefore, oncological literacy for plastic surgeons is essential to provide state-of-the-art breast cancer care and avoidance of suboptimal patient decisions.

Key Words: breast cancer management, breast cancer treatment, breast reconstruction, cancer treatment choice

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For decades, breast reconstructive approaches were dependent on changes in breast cancer treatment and attitudes of general surgeons and were unfavorable for breast reconstruction concepts.[1] Changes in attitudes occurred in the 1970s, when new reconstructive techniques made breast reconstruction safe and relatively successful, when it was recognized that reconstruction does not promote metastases or delays in the discovery of recurrences.[1,2] However, with respect to the endorsement of breast reconstruction, for a long time, general surgeons frequently took the "do not ask/do not tell" approach.[1–3]

In fact, postmastectomy breast reconstruction has come a long way since first described in 1885 by Vincenz Czerny, a professor at the University of Heidelberg in Germany. First volumes on breast reconstruction techniques were published in the late 1970s and early 1980s.[4] However, concurrently in the 1980s and 1990s, mastectomy rates fell as breast conservation became more widely accepted.[5] On the other hand, in the 2000s, increasing rates of mastectomies have been noted—even when breast conservation was a viable oncologic option.[6,7] Today, breast cancer patients are influenced by the advent of new oncoplastic approaches and operative techniques including microsurgery, improvements in tissue expansion, and breast implant technology, as well as public education, breast reconstruction advocacy, and access to reconstruction. These developments have conceivably contributed to changing the landscape of surgical management including raising interest in reconstructive options for partial breast defects.[1,2,5,8–11]

Many previously conducted studies illuminated oncological and patient-based variables affecting the choice and conduction of breast reconstruction.[1,2,10–12] However, little is known about how an increased participation of plastic surgeons, in many aspects of breast care, impacts patient's decisions in terms of breast cancer treatment. Therefore, the examination of a possible new paradigm and the reversal of the "traditional" direction of influence seemed timely. Specifically, evaluation of the possible impact of breast reconstruction and its extent on breast cancer management per se, including shared decisions, was the objective of this study.[1,2]

METHODS

The University of California San Diego Comprehensive Breast Health Care Program offers patients full access to all aspects of breast care with a low rate of disparities. Historically (2009–2016), metachronous plastic surgery consults were arranged for 50% of new patients, including patients with noninvasive breast cancer but at high risk of further cancer development. The other 50% reconstructive consults were rendered concurrently, during the same clinical session, with oncological consults. Program patients seen by dual-trained surgeons (plastic and oncological surgery) were excluded from this analysis.[12] Overall, this program, which averages an overall reconstruction rate of 68%, offers a credible and unique base of data to investigate how the exposure to breast reconstruction options impacts diverse patient choices pertaining to the management of the cancer itself without care access bias.[12]

The University of California San Diego physician-billing database revealed that a total of 520 patients with primary diagnosis of breast

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cancer were admitted for plastic surgery consultation and treatment between 2012 and 2016. A single-institution survey-based analysis was conducted investigating rates and types of patient's initial decision, decision change, or opting for a specific alternative with respect to cancer treatment after plastic surgery consultation. To test the plastic surgery impact, patients with recent (<4 weeks) diagnosis of primary breast cancer were included in the study. Following consultations by surgical and medical oncologists, patients with a defined preliminary treatment plan consulted with a plastic surgeon in person (in a geographically different clinic and on another day than the oncological consultations took place). Subsequently, these patients returned to oncologists to rediscuss and conclude the management plan (Fig. 1).

A subset of 90 patients were identified. These patients were diagnosed with primary breast cancer and had a preliminary defined oncological management plan and were in consideration of immediate breast reconstruction, including the possibility of joint oncoplastic procedures prior to their plastic surgery consultation. Patients were surveyed regarding any modification of their original personal choices and requests following plastic surgery consultation and prior to finalization of the overall oncological management plan (Fig. 2). The institutional review board at the University of California San Diego provided ethics approval for the study (130050).

RESULTS

Patient ages ranged from 23 to 88 years (mean 53.5 years). The subjects of this study were a subset of 90 patients who had a preliminary, tentative surgical treatment plan after the first round of oncological consultations and who consulted with a plastic surgeon prior to the finalization of the oncological management plan. Program patients managed surgically by a dual-trained surgeon (surgical oncology and plastic surgery) were not included. Patients in this group presented at various malignancy stages. Cancer classification stages per the American Joint Committee included carcinoma in situ (19 [21.1%]), stage I (30 [33.3%]), stage II (20 [22.2%]), stage III (18 [20%]), and stage IV (3 [3.3%]). After their plastic surgery consultation, all patients returned to their oncologists. After their plastic surgery consultation, 40 patients (44%) returned to their surgical or medical oncologist considering or requesting changes of the preliminary breast cancer management plan. Reported requests to alter the preliminary surgical plan or to choose a specific alternative of oncological surgery were as follows: mastectomy versus lumpectomy or quadrantectomy, 18 (20%); contralateral prophylactic mastectomy versus unilateral therapeutic mastectomy, 11 (12.2%); nipple/areola complex removal versus nipple/areola complex sparing surgery, 5 (5.5%); oncoplastic breast reduction or contouring with partial mastectomy versus lumpectomy alone, 5 (5.5%); and other in 3 cases (3.3.%). In the category of "other," choices included the following: 2 patients opted for tissue transfer (flaps) with implantation of brachytherapy catheters and the removal of the contralateral breast implant, placed for cosmetic indications by the patient prepared otherwise for lumpectomy. Two patients requested more than 1 change. Specific requests are summarized in Table 1. Whenever possible, the patient's reasoning was ascertained (both from survey data and medical records). The most frequently reported reasoning for opting toward mastectomy and prophylactic mastectomy was the awareness of outcomes of total breast reconstruction in the context of positive tests for BRCA1 (8 patients [8.9%]), BRCA2 (6 patients [6.7%]), or both (6 patients [6.7%]); early onset of cancer (5 patients [5.6%]); triple-negative status (6 patients [6.7%]); and/or multiple relatives with breast cancer (25 patients [28%]).[7,8,13,14] None of the patients indicated that the plastic surgeon provided different information related to outcomes and risks. Education provided by the plastic surgeon was perceived as affirmation or expansion of earlier information within the final expected aesthetic outcome perspective.

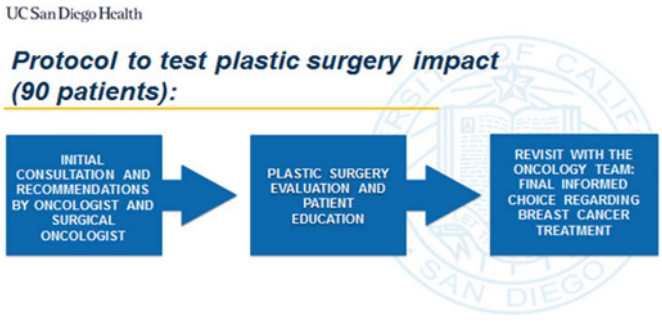

FIGURE 1. The sequencing of appointments: all consultations took place in a geographically different setting and on different dates.

Several patients (32 patients [35.6%]) indicated that they benefited from the plastic surgeon's guidance regarding the implications of variations in the definition of "safe" or appropriate margins in breast conservation surgery associated with volume of breast surgery and contour changes.[15] In 2 cases, patients who decided on contralateral prophylactic mastectomy quoted the plastic surgeon's statement that "in cases of bilateral autologous transverse rectus abdominis myocutaneous flap-based reconstructions, it is easier to achieve symmetry if reconstruction is performed at the same time" (Fig. 3). Circumstances of metachronous disease sometimes exemplify and support this perspective.[16]

Requests to resect the nipple/areola complex and de novo restoration either surgically or by means of a 3-dimensional tattoo technique stemmed from patient education on adverse outcomes of nipple/areola complex–sparing mastectomy.[8,17] Quoted adverse outcomes include lack of spared nipple sensitivity, the potential for occasional complex malposition, nipple(s) inversion, nipple loss, and the prospect of a "delayed" procedure, especially in patients with large, pendulous breast. Requests for oncoplastic breast reduction or other forms of breast shape–conserving surgical techniques were all related to patient appreciation of presented results (including good, average, and with challenging problems).[8,9,18]

DISCUSSION

Modern, personalized, effective breast cancer treatment needs providers with diverse expertise and skills. The comprehensive management of breast cancer must consider different circumstances that patients will have to cope with including the logistical, social, and cultural aspects of breast care. Different specialist providers involved impact each other, and evidence suggests that patients can grasp on sometimes contradictory concepts and recommendations and reasonably participate in sharing the decision-making process in designing and planning their cancer management.[19,20] Certainly, regional and cultural environments could impact not only patient decisions but also the style of health care information; therefore, decision tools may not be uniform. However, this report was created at the same institution and practice environment as previous ones; therefore, we believe that the ideas are comparable.[1,12,19,21] The University of California San Diego Comprehensive Breast Health Center Program, with approximately a 100% rate of patient access to all aspects of breast care and rate of disparities, offered a credible base to investigate how exposure to breast reconstruction impacts choices without care access bias.[12] The impact of external-to-oncological specialists on patient breast cancer treatment decisions is not exclusively related to plastic surgeons.[22,23] Overall trends toward the increase in the rate of some procedures such as contralateral prophylactic mastectomy are poorly understood. The rise in rate of mastectomies can be, to a degree, attributed to media (magazines, TV shows) or online sources (eg, WebMD, American Cancer Society) all impacting public awareness and causing a fear of recurrence despite the lack of evidence regarding the oncological outcome and long-term prognosis.[7,10,24]

Survey questions:

1. Which of the following surgical treatment plan was preliminarily recommended to you at the end of your oncological consults (check all that apply):
   - ❑ mastectomy - unilateral or bilateral (all therapeutic to remove cancer)
   - ❑ lumpectomy or form of partial mastectomy
   - ❑ nipple/areola sparing variant of surgery
   - ❑ contralateral prophylactic mastectomy
   - ❑ oncoplastic breast reduction with removal of diseased part of the breast
   - ❑ other interventions, specify_____
2. Did your oncologists initially recommend breast reconstruction as:
   - ❑ immediate procedure with you and your plastic surgeon choosing the method
   - ❑ delayed procedure (or series of procedures), and recommended plastic surgery consult prior to mastectomy
   - ❑ no reconstruction
3. Did you pursue research on surgical breast cancer treatment(s) prior to your visit with a plastic surgeon (mark all that apply):
   - ❑ none
   - ❑ other physician opinion(s)
   - ❑ meeting with other patients
   - ❑ family/friends
   - ❑ books/journals
   - ❑ Internet sources
   - ❑ Cancer organizations (i.e., ACS)
4. Was your visit with a plastic surgeon informative from the standpoint of breast cancer treatment:
   - ❑ yes
   - ❑ no
5. Did your consultation with a plastic surgeon precipitate a desire to change the original breast cancer treatment plan:
   - ❑ yes
   - ❑ no
6. Did you make your final decision (change or choice of an alternative) after plastic surgery consult but prior to your 2nd visit with oncologist:
   - ❑ yes
   - ❑ no
7. Describe briefly any change(s) or request(s) you may have made after plastic surgery consultation:
   - ❑ None
   - ❑ _____
     _____
8. Did you worry about making a "bad decision" regarding breast cancer treatment prior to your visit with a plastic surgeon:
   - ❑ yes
   - ❑ no
9. Did you worry about making a "bad decision" regarding breast cancer treatment after seeing a plastic surgeon but before returning to the oncologist:
   - ❑ yes
   - ❑ no
10. Do you prefer to make your health care decision by yourself rather than rely on doctors:
    - ❑ yes
    - ❑ no
11. If you decided to change the preliminary design of your breast cancer surgical treatment plan after seeing a plastic surgeon, did you worry about the cancer coming back or involving the other breast, as the major factor in your decision-making process:
    - ❑ yes
    - ❑ no
    - ❑ N/A, I did not change the initial plan
12. If you strongly considered or decided to change the preliminary design of your breast cancer treatment plan after seeing a plastic surgeon, was it due to your concerns about the overall cosmetic results:
    - ❑ yes
    - ❑ no
13. Please describe other (if any) educational benefits of your plastic surgery consultation.
    - ❑ None
    - ❑ _____
      _____

FIGURE 2. Survey questionnaires were provided to individual patients after the plastic surgery consultation with the request to complete and return them after the second visit with their medical/surgical oncologist. The survey requested submission of demographic data (eg, age, personal history of breast cancer, family history of breast cancer, genetic testing, BRCA status if known to the patient, understanding of preoperative magnetic resonance imaging, knowledge of additional abnormal findings [ipsilateral, contralateral], patient's comprehension of the index cancer requiring surgery, and knowledge of the cancer pathology [invasive ductal, lobular, ductal carcinoma in situ, mixed, known lymph node status]). The data were verified by the content of the patient's medical records.

TABLE 1. Patient-Reported Alteration of the Preliminary Surgical Plan After Plastic Surgery Consultation

Variable	No. (%) Requested Changes
Mastectomy as opposed to lumpectomy or quadrantectomy	18 (20)
Contralateral prophylactic mastectomy as opposed to unilateral therapeutic mastectomy	11 (12)
Nipple/areola removal as opposed to nipple/areola sparing	5 (6)
Oncoplastic breast reduction or contouring with lumpectomy as opposed to lumpectomy only	5 (6)
Other	3 (3)
Total amount of changes requested by the 40 patients	42

Two patients requested more than 1 change.

Perhaps the very high satisfaction rate (93%) among women who opted to undergo contralateral prophylactic mastectomy regardless of whether it was oncologically indicated is related to "decision co-ownership" as demonstrated by 2 of our patients.[25]

Patient education before the commencement of cancer treatment influences the rate of reconstructive procedures.[10–12,26] Simultaneous oncological and reconstructive comprehensive information leads to high rates of reconstruction and presumably reduces suboptimal, from the oncological or plastic surgery standpoint, patient decisions.[8,11,12,17,27,28] However, patient's metachronous exposure to reconstructive approaches and education, providing the patient some time for reflection and extra education, results in a significant rate of at least "second thoughts" or frankly for requests of changes in the preliminary oncological plan. Possibly, education on the aesthetic outcomes, balanced information on the pitfalls of different procedures, and repeated exposure of the patient to the oncological perspective, as a geographically and timely separate encounter with another surgical consultant, all contribute to a significant rate of changes or consideration of changes. The availability and quality of reconstructive consults and surgical outcomes can motivate patients to modify the management plan or at least favor a specific treatment alternative.[15–18] Patients whose decisional needs are unresolved or patients who feel rushed, may ultimately delay decisions, feel regrets and uncertainties regarding the original plans, and blame surgeons for untoward or different-than-expected outcomes.[29]

FIGURE 3. Patient with lobular breast carcinoma of the left breast treated by mastectomy with reconstruction utilizing transverse rectus abdominis flap in 1994 could not have the same technique for reconstruction after mastectomy for lobular right breast carcinoma, which she developed in 2003. The right breast was reconstructed utilizing an ipsilateral latissimus dorsi myocutaneous flap. This patient exemplifies the notion that symmetry of the breast appearance is easier to provide if concurrent and same reconstructive technique is utilized.

Plastic surgeons are increasingly influencing the multispecialty breast cancer management and patient decision-making process. Therefore, each patient who plans a surgical intervention of any type, not only mastectomy, should obtain relevant breast reconstruction information because it may impact the choice of the oncological procedure. Patients yearn for someone to tell them nonbiased truths. Too many times the truth is elusive or "politically correct," and these types of recommendations are not helpful to the patient in making the right decision.[1,3,17,30]

Consequently, with the recognition and appreciation of the potential impact the plastic surgery specialty may exert, plastic surgeons should be compelled to stay oncologically "literate" and be able to provide reconstructive consultations respecting the rule "Primum non nocere." Reconstructive surgeons should provide nonbiased education with an awareness that even inadvertent suboptimal advice may impair state-of-the-art breast cancer care.[7,12,31,32] In particular, with the advent of oncoplastic approaches, plastic surgeons have to appropriately counsel patients and consider predictors of residual disease and high re-excision rates (22%) after breast conservation surgery and master tumor site/lumpectomy wound wall localization techniques.[32] In addition, plastic surgeons have to read fine prints of tests results, intercept, and identify provisional diagnoses, because overly concerned patients may execute an aggressive choice that could remove diagnostic precautions, resulting in unnecessary loss of breast.[33]

CONCLUSIONS

Plastic surgeons impact the patient's decision concerning all oncological aspects of breast cancer care. Probably the same is true for other nonsurgical or medical oncology specialties participating in comprehensive breast cancer management. Therefore, multidirectional communication between surgical and nonsurgical team members is critical to ensure state-of-the-art, comprehensive decisions in all aspects of breast cancer treatment.

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